phosed arkose is provisionally referred to the Gedinnian division of the system.

M. Renard is understood to be at work upon a detailed memoir on the metamorphosed rocks of the Ardennes, in which their chemical constitution and microscopic characters will be fully described.

THE RECENT STORM

THE great and destructive storm of Saturday and Sunday last may almost take rank as a historical event, seeing that on the Saturday evening atmospheric pressure fell considerably lower in Scotland than is known ever to have occurred in these islands since the barometer became an instrument of observation. This remarkable barometric fluctuation, as observed at Edinburgh, is shown by the following observations made on those two days, the observations being reduced to 32° and sea level:—

	Barometer Inches		Barometer Inches		Barometer Inches
Saturday.		Saturday.		Saturday.	
9.0 a.m.	28·934	5.30 p.m.	27·853	9.30 p.m.	27·467
2.0 p.m.	28·376	6.0 ,,	·819	10.0 ,,	·451
2.30 ,,	·266	6.30 ,,	·779	10.30 ,,	·464
3.0 ,,	·167	7.0 ,,	·721	11.0 ,,	·505
3.30 ,,	·064	7.30 ,,	·6 1	11.30 ,,	·565
4.0 ,,	27·984	8.0 ,,	·580	Sunday.	
4.30 ,,	·934	8.30 ,,	·516	3.0 a.m.	27·835
5.0 ,,	·921	9.0 ,,	·494	4.30 ,,	·968
				9.0 ,,	28·311

As the barometer was closely watched for some time before and after 10 p.m., and no change was observed, the reading 27·451 inches may be regarded as absolutely the lowest that occurred. Since the wind veered during the storm from S.E. by S.W. to N.W., the centre of the storm passed to the northward, and along its path still lower readings were doubtless recorded.

The following observations have been already received, showing in inches the lowest observed readings and the hour when they occurred:—Moffat, 27·662 at 10·15 p.m.; Marchmont, near Duns, 27·581 at 11 p.m.; Inverness, 27·516 at 11·10 p.m.; Fort William, 27·467 at 8 p.m.; Joppa, near Edinburgh, 27·464, Leith, 27·453, and Edinburgh, 27·451, at 10 p.m.; Glasgow, 27·427 at 9 p.m.; Dundee, 27·382 at 10·30 p.m.; Ochtertyre, near Crieff, 27·332 at 9·45 p.m.; and 27·400 is stated to have occurred at Aberdeen. With the observations made at the 160 stations of the Scottish Meteorological Society, it will, in a few days, be easy to trace the history of this extraordinary atmospheric depression in its passage across the island.

At Ben Nevis Observatory, the lowest reading of the barometer on Saturday, 23·173 inches, occurred at 8.30 p.m.; at noon, temperature was 15°, and at 10 p.m. 22°; at 7 p.m. the wind was S.E. force 8, and at 10 p.m., N.E. force 4.

In the sixty years preceding 1827, during which Mr. James Hoy made barometric observations, the lowest reading was 28·007 inches; during the last 43 years observations have been made at Culloden, and the lowest reading, observed by the late Mr. Arthur Forbes, was 27·984 inches at 11 a.m. on December 27, 1852. During the interval between these two long continued series of observations, Mr. George Innes, optician, made observations at Aberdeen; and on the occasion of the memorable storm of January 7, 1839, recorded an observation on that morning of 27·695 inches. On the same morning, at 9 o'clock, the lighthouses on the east of Scotland, which were near the centre of the storm at the time showed readings varying from 27·806 inches in the Firth of Forth, to 27·716 inches near Peterhead.

As these three series of observations extend over the last 120 years, it is evident that over at least the east of Scotland, from Inverness to the Tweed, atmospheric pressure fell on the evening of Saturday the 26th from a third to half an inch lower than has occurred during that extended period.

NOTES

WE are glad to be able to announce that Prof. Flower has been definitely appointed by the Trustees to the position of Superintendent of the Natural History Department of the British Museum, vacated by the recent resignation of Sir Richard Owen.

THE German Emperor, at the instance of the Berlin Academy of Sciences, has been pleased to make Prof. Sir William Thomson a Knight of the Order *Pour le Mérite* for Science and Art.

ACCORDING to an announcement made by Prof. E. Stefan at the last meeting of the Vienna Physical Society, Prof. S. von Wroblewski, of Krakow, has succeeded in solidifying hydrogen.

IT is reported that Prof. Wilhelm Klinkerfues, the well-known astronomer, shot himself on Monday in the Observatory at Göttingen.

WE are glad to see that the fishermen of Scotland have at last realised the necessity of a thorough scientific investigation into the habits of fish. At a meeting at Peterhead the other day the Solicitor-General for Scotland was requested to help the fishermen to obtain Government aid for the prosecution of such research; the country, it was admitted, is behind all others "in scientific information on fish." The Solicitor-General, Mr. Asher, admitted the lamentable deficiency of our knowledge of the habits of food fishes, and promised to do all he could to obtain a grant for the Committee of the Fisheries Board, who are now endeavouring, with the slender means at their command, to investigate the subject. "Prof. Ewart and his colleagues," Mr. Asher stated, "had entered upon an investigation which, if duly prosecuted, could not fail to be productive of immense results and advantages in connection with all kinds of fisheries."

AT the end of March the Austrian botanist, Mr. Joseph Knapp, Conservator des Herbariums des Allgemeinen Oesterreichischen Apothekervereines of Vienna, will go to Northern Persia (Azerbijan), with a scientific expedition for exploring the flora and fauna of that little-known province.

DURING February Prof. W. K. Parker will give a series of lectures at the Royal College of Surgeons on Mammalian Descent, as follows:—February 4th, Introductory; 6th, On Monotremes; 8th, On Marsupials; 11th, On Edentata; 13th, On Insectivora; 15th, Insectivora (continued); 18th, Insectivora (concluded); 20th, On the remaining Orders of Mammalia; 22nd, On Man (conclusion).

IN connection with the opening of the Turin Exhibition, the Italian Government offers a prize of 400*l.* to the inventor of the most practicable method for the transmission of electricity to a distance. The competition will be international.

WITHIN a few days the exhibition of the *Talisman* collection will be opened at the Jardin des Plantes of Paris, with diagrams exhibiting the circumstances of the operations, and the instruments which were used.

THE Asiatic Society of Bengal celebrated its centenary on Tuesday last week. The proceedings began with a special meeting, the Hon. H. Reynolds, the President of the Society, being in the chair. Six gentlemen, namely, Dr. Joule, Prof. Haeckel, Mr. Charles Meldrum, Prof. Sayce, M. E. Senart, and Prof. Monier Williams, were elected honorary members.

THE Cambridge University Press announces for publication "A Treatise on the General Principles of Chemistry," by M. M. Pattison Muir, M.A. This book is intended to give a fairly complete account of the present state of knowledge regarding the principles and general laws of chemistry; it is addressed to those students who have already a considerable acquaintance with descriptive chemistry, and it is hoped that by such students the book will be found complete in itself. An attempt is made to treat the chief theories of modern chemistry to some extent from an historical point of view, and to trace the connection between the older theories and those which now prevail in the science. Full references are given to all memoirs of importance. The first part treats of the atomic and molecular theory, and the application thereof to such objects as allotropy, isomerism, and the classification of elements and compounds; fairly complete accounts are also given of the methods and more important applications of thermal, optical, and other parts of physical chemistry. The second part is devoted to the subjects of chemical affinity, relations between chemical action and losses or gains of energy, and the various questions suggested by the expression "chemical equilibrium."

AT the weekly meeting of the Society of Arts on Wednesday last week, under the presidency of Sir John Lubbock, a paper was read by Mr. W. L. Carpenter, on "Science Teaching in Elementary Schools." The chairman said the subject under consideration was one of very great importance. The Duke of Devonshire's Commission had reported that the neglect of science and modern languages in our schools was a national misfortune; and though, no doubt, there was some improvement since that time, almost the same might be said now. Considering how much science had done, and was doing for us, the general, though happily now not universal, neglect of it in our schools was astonishing. If we did not avail ourselves to the utmost of the resources of nature, our great and growing population would become more and more miserable, and they would be distanced in the race by foreign nations. Mr. Carpenter said his object was not merely to draw attention to the crying need for elementary scientific instruction in our primary schools, but also to point out how such instruction could best be given, and to show that that could be done, and had been done on a large scale, with extraordinarily beneficial results to the children thus taught, without any more expenditure of time than at present. The one great mistake which vitiated the whole organisation of English education was the conception of intellectual training as the acquisition of information rather than as the development of the faculties. He pointed out the enormous value of science teaching in quickening the intelligence, as well as the very great practical value of the knowledge imparted. The special feature of the Liverpool School Board system was that the science demonstrations and experiments were given not by the ordinary staff of the school, but by a specially-appointed expert, whose sole duty it was to go round from school to school, giving practically the same lesson in each one until all had been visited, and abandoning altogether the use of text-books by the scholars. The results of that system were (1) the general quickening of the intellectual life of the school; (2) the sending of a large number of lads to science classes after leaving school; (3) the finding out of lads of exceptional scientific ability, and setting them on their road; (4) the attracting the attention of the ordinary teachers to science and to the results of teaching it. He concluded by urging that instruction in some branch of elementary science, preferably mechanics or physics for boys, and domestic economy for girls, should form a necssary part of the education of every child who remained in a public elementary school above Standard IV., that such instruction should be oral, that such teaching should be given during the ordinary school hours, and that such alterations should be made in the scale of grants under the new Code as should encourage the teaching of elementary science.

OUR readers may remember that some years ago Lieut. Julius von Payer, one of the discoverers of Franz Josef Land, gave up the sea for the brush; but he has carried his Arctic enthusiasm into art. He has for years been engaged on a series of four pictures illustrating the last expedition of Sir John Franklin, and according to the *Times* Paris Correspondent, the last of them, entitled "Starvation Cove," is just completed. Lieut. Payer has taken the greatest pains to acquaint himself with the minutest details of the expeditions of the *Erebus* and *Terror*, their formation and equipment, and the pictures will at least be interesting. We hope they may be exhibited in this country.

THE catalogue of the scientific books in the Reference Department of the Nottingham Free Library spins a list of about 750 titles out into a catalogue of nearly 40 pages, with between 50 and 60 entries upon each, and among them are a good collection of the most important *Journals* and *Transactions*. To a library the wide circle of whose frequenters forbids its shelves being thrown open to them all, it is doubtful whether a small collection of works with a full subject-catalogue is not of greater advantage than a large accumulation of books of which the librarian only is aware. But instead of giving any reference at all to the *subjects* treated in these books and papers, there is only given here the name of each *writer* and the heading under which his production may be found. This can be of little use to any student and none at all to the majority of those using a free library. A supplement of something less than 200 titles is added now, but the collection is so small at present that it is beneath criticism as to its deficiencies.

A TELEGRAM from Constantinople, Jan. 23, states that during the previous fortnight shocks of earthquake, varying in severity, have been felt throughout the district of Kalah-Jik, in the province of Castambul. Some of the minarets of the mosques have fallen in. Shocks also continue to be felt in Central Asia. One occurred at Tashkend a few days ago. A correspondent, writing from Vierno to the *Turkestan Gazette*, states that they have been lately very frequent, and somewhat severe at Oosh. Several shocks have also been recently experienced at Tiflis.

THE Naples Correspondent of the *Standard* writes:—"Prof. Silvestri, Director of the Observatory on Mount Etna, reported on the 15th inst. that frequent movements of the soil had taken place at Nicolosi and all the other villages near the site of the eruption of last March. Besides this, within a zone of about 60 km. in extent, the villages of Biancaritta, Aderno, Bronte, Maletto, Randazzo, Linguaglossa, and Piedimonte have experienced during the last few days subsultory and undulatory shocks; the most remarkable occurring on the evenings of the 10th and 14th inst. The oscillations moved in a north-easterly direction, along the mountain chain of Pilori, and were distinctly but slightly felt at Castiglione, Rovara, Castroreale, and as far as Messina. No damage was done, but at Randazzo and Linguaglossa, where the shocks were stronger, the people were much alarmed. At Catania, only the instruments of the Observatory registered the perturbation coincident with the above-mentioned shocks."

THE additions to the Zoological Society's Gardens during the past week include three Bonnet Monkeys (*Macacus sinicus* ♂ ♀ ♀) from India, a Toque Monkey (*Macacus pileatus*) from Ceylon, an Arabian Baboon (*Cynocephalus hamadryas* ♂) from Arabia, an Indian Gazelle (*Gazella bennetti* ♂) from India, presented by Capt. Spencer Stanhope; two Bonnet Monkeys (*Macacus sinicus* ♂ ♀) from India, presented by Mrs. St. John Mitchell; a Huanaco (*Lama huanacos* ♀) from Peru, presented by Mr. J. W. Firth; four Harvest Mice (*Mus minutus*), British, presented by Mr. G. T. Rope; a Greater Sulphur-crested Cockatoo (*Cacatua galerita*) from Australia, presented by Mr. George Wood; a Great Grey Shrike (*Lanius excubitor*), British, presented by Master Arthur Blyth; two American Flying Squirrels (*Sciuropterus volucella*) from North America, presented by Mr. F. S. Mosely, F.Z.S.; a Cape Adder (*Vipera atropus*) from South Africa, presented by Mr. C. B. Pillans; a Black Tanager (*Tachyphonus melaleucus*), a White-throated Finch (*Spermophila albigularis*), a Tropical Seed Finch (*Oryzoborus torridus*), a Common Boa (*Boa constrictor*), a South African Rat Snake (*Spilotes variabilis*) from South America, a Cheela Eagle (*Spilornis cheela*) from Ceylon, two Illiger's Macaws (*Ara maracana*) from Brazil, a Common Guillemot (*Lomvia troile*), British, purchased; two Brown-tailed Gerbilles (*Gerbillus erythrurus*), born in the Gardens.

GEOGRAPHICAL NOTES

THE first report of Prof. Hull, dated from Gaza, January 1, has been received. It is necessarily brief, the details being reserved for the full report to follow, but it announces the success of the expedition so far. The professor has made a complete geological survey of the Wady Arabah and the Dead Sea, with a traverse across Southern Palestine. Capt. Kitchener, R.E., who accompanied him, has made a trigonometrical survey. Akabah he found to be laid down too far south; the south part of the Dead Sea as shown on the maps, is quite out of its true shape and position, and the Lisan has to be shifted three miles. From Gaza, when the rest of the party were in quarantine, Capt. Kitchener rode back to Egypt, accompanied by four Arabs only. He took a previously unknown route, particulars as to which will follow, and arrived at Ismaïlia after a ride of 200 miles. He was everywhere well received by the Arabs, who took him for a cousin of Sheikh Abdullah (the late Prof. Palmer), whose memory is still revered among them, and whose murder they still deplore. They are also reported to be deeply impressed with the energy and pertinacity of Sir Charles Warren's pursuit of the murderers. As regards the other members of Prof. Hull's party, Mr. Hart is reported to have made large additions to the flora; Mr. Lawrence has kept a continuous series of meteorological observations, and Mr. Gordon Hull has obtained a hundred photographs, large and small. Prof. Hull had still to execute two traverses of the country, in which he is no doubt at present engaged. The complete reports, both of himself and Capt. Kitchener, will be extremely important. They will probably be published in the journal of the Society.

WE have received the ninth issue of the *Geographisches Jahrbuch*. In the present volume, the reports which appeared in the first six publications on the additions successively made to our knowledge of extra-European parts of the earth are resumed; the new African annexations to geography being disposed of by Prof. K. Zöppritz, the Asiatic by Dr. Hans Lullies, and the Polar by Herr W. Wichmann. Two important departments in geography find for the first time distinct places assigned them in the present number; geographical onomatology and theoretic cartography. The former has indeed but very recently been recognised as the independent and important province of geography it really is. The first and as yet only comprehensive scientific work on the subject is that by its reviewer in the present *Jahrbuch*, Prof. J. J. Egli, "Versuch einer Allgemeinen Geographischen Onomatologie" (Leipzig, 1870–72), essay towards a general geographical onomatology. The name of a place is either immediately descriptive of its physical features ("nature-names," as Prof. Egli calls this class) or descriptive of some historical or other connection between the place and its earlier or later inhabitants or discoverers ("culture-names"), in either and every case is significant and interesting and an organic part of its geography.—Prof. Sigismund Günther, in his masterly review of theoretic cartography, first gives a brief yet clear and comprehensive "history of the development of geometrical cartography," taking notice more particularly of modern works on the subject, and then estimates recent works on projection.—Prof. von Oppolzer, reporting the progress made in European measurement of degrees, summarises the transactions of the sixth General Conference held on the subject at Munich, September 13–16, 1880. He calls special attention to the results deduced by von Bauernfeind from taking the measurement of the zenith simultaneously at Dobra and Kappellenburg, in which the same anomalies came to light as those pointed out years before by von Bayer. These anomalies are entirely parallel with those which appear in taking barometrical measurements of heights, and von Bauernfeind attributes them to the circumstance that the registered temperatures at given places form no correct criterion of the temperatures of the intermediate air-strata, the temperatures at the given places being to a certain extent determined by purely local influences. These conclusions are confirmed by Oppolzer's studies in astronomical refraction, in which analogous anomalies are to be explained by the fact that the universal law of diminution of temperature with ascent is modified in the lowest air-strata by local causes. In clear nights, *e.g.*, the temperature in the lowest atmospheric strata invariably rises with ascent up to a certain moderate height. During the day, on the other hand, in corresponding conditions, temperature diminishes with ascent at a rate considerably above the average. These facts afford Oppolzer a very simple explanation of hitherto puzzling phenomena.—In the review of geographical meteorology by Prof. J. Hann is presented a great treasure of data as to rainfall, nebulosity, atmospheric pressures, winds, &c.—In a map by Remon of the nebulosities of different parts of Europe and North Africa, the extremes are given at 20 in the Algerian Sahara, and 68° in the north-west of Europe. Cloudiness in general diminishes southwards and eastwards, as compared with the centre of Europe.—Space allows only of the bare mention of the review of the geography of plants by Prof. Drude; of animals, by Prof. Schmarda; of ethnology, by Prof. Gerland; of deep sea exploration, by Prof. von Boguslawski; of the structure of the earth's surface, by Prof. von Fritsch; and of the method of geography, by Prof. Wagner.

WE understand that the expedition with which Mr. Wilfrid Powell has undertaken to explore New Guinea will leave this country about the beginning of March. It will consist of Mr. Powell, with four or five Europeans, including a naturalist and a geologist, and the work of traversing the thousand or twelve hundred miles which have been mapped out for the route is likely to occupy over a year. Mr. Powell has chartered a small screw steamer, in which the party will proceed up the Ambernoli river, a large stream in Dutch territory, on the north coast. The explorers will proceed up this river in a steam launch as far as they can get. The launch will then return to the steamer, and the party will strike in a south-westerly direction across the high central range of mountains which runs from east to west, called the Snow Mountains, or the Finisterre Mountains. When this difficult task has been accomplished, Mr. Powell will march to the east coast, where he will hope to find his screw steamer in Astrolabe Bay. After refitting, he will again strike westwards, across the south-east corner of the island, to Port Moresby. Mr. Powell will thus explore the country from north to south, avoiding the Fly River, or any other portion which has been visited by Europeans.

THE *St. Petersburger Zeitung* has received news from Khartoum about Dr. Junker. Herr Bohndorf, Dr. Junker's companion, has arrived at Khartoum, and reports that Junker is still in the Niam Niam country, and that his researches are favourably progressing.

THE last issue of the *Bulletin* of the St. Petersburg Academy of Sciences contains a letter of M. Bunge, the medical officer of the Lena polar meteorological station. The country around the station is but little fitted for collecting. It is a flat region, periodically covered by the tide, and there may be no question about sea-flora or sea-fauna to be found in the creeks that intersect the ground. The ice bear sometimes makes his appearance, as also the wolf, the fox, especially *Canis lagopus*, of which the neighbouring Yakuts catch about 300 every year; the *Mustela herminea* is not very rare. The Yakuts do not know lemmings, but one species at least, the *Myodes torquatus*, inhabits the delta. The reindeer come in large flocks in the summer, returning to the forest region in the autumn. They are killed when passing the streams, shooting being prohibited by the Yakut community. One *Ægocerus montanus* has been perceived, from a great distance, within the delta. Walruses, sometimes seals, and dolphins also enter the mouth of the Lena. As to the birds, M. Bunge gives a list of 101 species he has observed or shot during his journey. The water invertebrata are